CONTENTS

VOLUME 51 NUMBER 1 (Published 15 December 1989) JANUARY 1990

Notice

I SI units, conversion factors and abbreviations

Articles

Sang Chul Shim, Sang Sun Lee and Seung Ju Choi 1 The C_4-photocyclodimers of 4,5′,8-trimethylpsoralen (TMP)

Jorge Davila and Anthony Harriman 9 Photoreactions of macrocyclic dyes bound to human serum albumin

Johan Lind and Gábor Merényi 21 Kinetics and thermodynamics of the autoxidation of reduced flavin mononucleotide (FMN)

A. A. Gorman, I. Hamblett, C. Lambert and A. L. Prescott 29 A pulse radiolysis and pulsed laser study of the vitamin D3 triplet state: lifetime, relaxation and 'nonvertical' excitation

Ned A. Porter and John D. Bruhnke 37 Photocoagulation of human plasma: acyl serine proteinase photochemistry

G. Schermann, A. Völcker, K. Seikel, R. Schmidt, H.-D. Brauer and F.-P. Montforts 45 Potential photosensitizers for photodynamic tumor therapy—I. Photophysical properties of two chlorin derivatives

E. A. Lissi, M. V. Encinas, S. G. Bertolotti, J. J. Cosa and C. M. Previtali 53 Fluorescence quenching of indolic compounds in reverse micelles of AOT

Philip E. Hartman, Zlata Hartman and Katherine T. Ault 59 Scavenging of singlet molecular oxygen by imidazole compounds: high and sustained activities of carboxy terminal histidine dipeptides and exceptional activity of imidazole-4-acetic acid

Johann M. Zdolsek, G. Mikael Olsson and Ulf T. Brunk 67 Photooxidative damage to lysosomes of cultured macrophages by acridine orange

Torleif Härd, Pei Fan and David R. Kearns 77 A fluorescence study of the binding of Hoechst 33258 and DAPI to halogenated DNAs

Teruyuki Nagamune, Hideyuki Kurata, Makoto Hirata, Jun Honda, Akira Hirata and Isao Endo 87 Photosensitive phenomena of nitrile hydratase of *Rhodococcus* sp. N-771

Ranjit Chatterjee, Mark J. Benzinger, Jayne L. Ritter and Donald L. Bissett 91 Chronic ultraviolet B radiation-induced biochemical changes in the skin of hairless mice

Benjamin A. Horwitz, Alexander Perlman and Jonathan Gressel 99 Induction of *Trichoderma* sporulation by nanosecond laser pulses: evidence against cryptochrome cycling

Yasuhiko Izutani, Shingo Takagi and Reiko Nagai 105 Orientation movements of chloroplasts in *Vallisneria* epidermal cells: different effects of light at low- and high-fluence rate

Klaus Humbeck 113 Light-dependent carotenoid biosynthesis in mutant C-6D of *Scenedesmus obliquus*

Yasushi Koyama, Ichiro Takatsuka, Mariko Kanaji, Koichi Tomimoto, Mariko Kito, Toshio Shimamura, Jinpei Yamashita, Kayoko Saiki and Kiyoshi Tsukida 119 Configurations of carotenoids in the reaction center and the light-harvesting complex of *Rhodospirillum rubrum*. Natural selection of carotenoid configurations by pigment protein complexes

VOLUME 51 NUMBER 2 (Published 30 January 1990) FEBRUARY 1990

PHOTOCHEMISTRY SECTION

Articles

Marye Anne Fox and Phillip F. Britt 129 Photophysics and photochemistry of bis-2-(9-anthryl)ethyl glutarate

James Elver Johnson, Mohammad Arfan, Richard Hodzi, Lyman R. Caswell and Susan Rasmussen 139 Mechanisms of photoelimination reactions of alkyl benzohydroxamates

A. A. Gorman, I. Hamblett and S. P. McNeeney — 145 Sensitization of the norbornadiene to quadricyclene conversion by substituted benzophenones: evidence against biradical intermediacy

PHOTOBIOLOGY SECTION

Articles

Ralph S. Becker, Sankar Chakravorti and Minjoong Yoon — 151 Photochemical and photophysical properties of piroxicam and benoxaprofen in various solvents

T. Melvin and Gary B. Schuster — 155 The photochemistry of acetyl-substituted aroyl azides: the design of photolabeling agents for inert sites in hydrophobic regions

John-Stephen Taylor, Hwang-Fun Lu and John J. Kotyk — 161 Quantitative conversion of the (6–4) photoproduct of TpdC to its Dewar valence isomer upon exposure to simulated sunlight

Giovanni Bottiroli, Anna Cleta Croce and Patrizia Vaghi — 169 Equilibrium among hematoporphyrin derivative components—II. Effect of esterase activity

Shigeru Takagi, Nobuyuki Mizuno, Kayo Adachi and Takashi Wakabayashi — 175 Effects of demethylchlortetracycline phototoxicity on the structure and functions of rat liver mitochondria

M. Dellinger, C. Vever-Bizet, D. Brault, G. Moreno and C. Salet — 185 Uptake and photodynamic efficiency of hematoporphyrin, hydroxyethylvinyl-deuteroporphyrin and hematoporphyrin derivative (Photofrin II®): a study with isolated mitochondria

Mladen Korbelik, Jaclyn Hung, Stephen Lam and Branko Palcic — 191 The effects of low density lipoproteins on uptake of Photofrin II

B. Kruizinga and D. G. Stavenga — 197 Fluorescence spectra of blowfly metaxanthopsins

John H. McClendon and Leonid Fukshansky — 203 On the interpretation of absorption spectra of leaves—I. Introduction and the correction of leaf spectra for surface reflection

John H. McClendon and Leonid Fukshansky — 211 On the interpretation of absorption spectra of leaves—II. The non-absorbed ray of the sieve effect and the mean optical pathlength in the remainder of the leaf

A. Struck, E. Cmiel, S. Schneider and H. Scheer — 217 Photochemical ring-opening in *meso*-chlorinated chlorophylls

Humphrey I. X. Mager and Shiao-Chun Tu — 223 Dithionite treatment of flavins: spectral evidence for covalent adduct formation and effect on *in vitro* bacterial bioluminescence

Review Article

Steven D. Schwartzbach — 231 Photocontrol of organelle biogenesis in *Euglena*

VOLUME 51 NUMBER 3 (Published 16 February 1990) MARCH 1990

Articles

R. Costalat, J. Blais, J.-P. Ballini, A. Moysan, J. Cadet, O. Chalvet and P. Vigny — 255 Formation of cyclobutane thymine dimers photosensitized by pyrido-psoralens: a triplet–triplet energy transfer mechanism

Sherry J. Farrow, Taj Mohammad, William Baird and Harry Morrison — 263 Photolytic covalent binding of indoleacrylic acid to DNA

Joseph P. Y. Kao, Stephen T. Isaacs and John E. Hearst — 273 The molecular and stereochemical structures of photoproducts generated by UV-irradiation of 4′-hydroxymethyl-4,5′,8′-trimethylpsoralen in aqueous solution

Francis D'Souza and V. Krishnan — 285 Intramolecular donor–acceptor systems: structures of novel linked porphyrin–phenolphthalein molecular systems

P. Di Mascio, C. F. M. Menck, R. G. Nigro, A. Sarasin and H. Sies — 293 Singlet molecular oxygen induced mutagenicity in a mammalian SV40-based shuttle vector

Jeffrey R. Kanofsky — 299 Quenching of singlet oxygen by human plasma

Sami Ahmad and Ronald S. Pardini	305	Antioxidant defense of the cabbage looper, *Trichoplusia ni*: enzymatic responses to the superoxide-generating flavonoid, quercetin, and photodynamic furanocoumarin, xanthotoxin
Benoit Paquette, Hasrat Ali, Réjean Langlois and Johan E. van Lier	313	Biological activities of phthalocyanines—XI. Phototoxicity of sulfonated aluminum naphthalocyanines towards V-79 Chinese hamster cells
K. G. Specht and M. A. J. Rodgers	319	Depolarization of mouse myeloma cell membranes during photodynamic action
H. J. C. M. Sterenborg and J. C. van der Leun	325	Tumorigenesis by a long wavelength UV-A source
David Keszenman-Pereyra	331	Repair of UV-damaged incoming plasmid DNA in *Saccharomyces cerevisiae*
Michael S. Patterson, Brian C. Wilson and Ronald Graff	343	*In vivo* tests of the concept of photodynamic threshold dose in normal rat liver photosensitized by aluminum chlorosulphonated phthalocyanine
D. Wöhrle, N. Iskander, G. Graschew, H. Sinn, E. A. Friedrich, W. Maier-Borst, J. Stern and P. Schlag	351	Synthesis of positively charged phthalocyanines and their activity in the photodynamic therapy of cancer cells
S. Chenchal Rao, Ch. Mohan Rao and D. Balasubramanian	357	The conformational status of a protein influences the aerobic photolysis of its tryptophan residues: melittin, β-lactoglobulin and the crystallins
D. H. Tallmadge and R. F. Borkman	363	The rates of photolysis of the four individual tryptophan residues in UV exposed calf γ-II crystallin
Ursula Hecht and Hans Mohr	369	Relationship between phytochrome photoconversion and response
Research Notes		
Kevin J. Willis, Arthur G. Szabo and Donald T. Krajcarski	375	The use of Stokes Raman scattering in time correlated single photon counting: application to the fluorescence lifetime of tyrosinate
Johan Moan and Helle Anholt	379	Phthalocyanine fluorescence in tumors during PDT
Technical Note		
Homer S. Black and Michael A. J. Rodgers	383	Glass and plastic photoluminescence: interaction with aqueous media and cultured mammalian cells
Book Review	387	

VOLUME 51 NUMBER 4 (Published 26 March 1990) APRIL 1990

Articles		
D. Z. Marković, T. Durand and L. K. Patterson	389	Hydrogen abstraction from lipids by triplet states of derivatized benzophenone photosensitizers
Rubinah K. Chowdhary, Robert B. Cundall and Christopher G. Morgan	395	Influence of fluorocarbon emulsions on porphyrin-sensitised oxidation of histidine
B. Czochralska, E. Bojarska, K. Pawlicki and D. Shugar	401	Photochemical and enzymatic redox transformations of reduced forms of coenzyme $NADP^+$
James M. Gale and Michael J. Smerdon	411	UV induced (6-4) photoproducts are distributed differently than cyclobutane dimers in nucleosomes
Devens Gust, Thomas A. Moore, David K. Luttrull, Gilbert R. Seely, Edith Bittersmann, René V. Bensasson, Michel Rougée, Edward J. Land, F. C. De Schryver and M. Van der Auweraer	419	Photophysical properties of 2-nitro-5,10,15,20-tetra-*p*-tolylporphyrins
C. J. Mertz, A. D. S. Marques, L. Neil Williamson and C. T. Lin	427	Photophysical studies of local anesthetics, tetracaine and procaine: drug aggregations

Michael J. Doughty and Anthony P. Cullen 439 Long-term effects of a single dose of ultraviolet-B on albino rabbit cornea—II. Deturgescence and fluid pump assessed *in vitro*

Janine R. Shulok, Margaret H. Wade and Chi-Wei Lin 451 Subcellular localization of hematoporphyrin derivative in bladder tumor cells in culture

Karim Fahmy and Friedrich Siebert 459 The photoreaction of the deionized form of the purple membrane investigated by FTIR difference spectroscopy

James Dillon and Stephen J. Atherton 465 Time resolved spectroscopic studies on the intact human lens

Moritoshi Iino, Kohji Shitanishi, Akeo Kadota and Masamitsu Wada 469 Phytochrome-mediated phototropism in *Adiantum* protonemata—I. Phototropism as a function of the lateral Pfr gradient

Research Notes

L. E. Bockstahler, R. K. Elespuru, V. M. Hitchins, P. G. Carney, K. M. Olvey and C. D. Lytle 477 Inhibition of *Herpes virus* plaquing capacity in human diploid fibroblasts treated with gilvocarcin V plus near UV radiation

Michel Havaux 481 "Energy"-dependent quenching of chlorophyll fluorescence and thermal energy dissipation in intact leaves during induction of photosynthesis

Juan E. Brunet, Carolina Jullian and David M. Jameson 487 Oxygen diffusion through horseradish peroxidase

Technical Note

Lucie Lorrain, Michel Havaux, Alain Tessier and Roger M. Leblanc 491 Photothermal deflection spectroscopy of photosynthetic pigments *in vivo* and *in vitro*

Photobiology School

Albert W. Girotti 497 Photodynamic lipid peroxidation in biological systems

Book Review 511

VOLUME 51 NUMBER 5 (Published 27 April 1990) MAY 1990

Editorial

Pill-Soon Song 513 Beyond your shelf...

Articles

S. Pennanen and A. Huhtikangas 515 Photochemical one-pot synthesis of vinblastine and vincristine

P. Y. Turpin, L. Chinsky, A. Laigle, M. Tsuboi, J. R. Kincaid and K. Nakamoto 519 A porphyrin–DNA exciplex: resonance Raman spectra of electronically excited Cu(TMpy-P4) bound to poly(dA-dT) · poly(dA-dT)

Irene E. Kochevar and Lisa A. Buckley 527 Photochemistry of DNA using 193 nm excimer laser radiation

Ralph S. Becker, Sankar Chakravorti and Suresh Das 533 The photosensitizers benzophenoxazine and thiazines: comprehensive investigation of photophysical and photochemical properties

Mark F. Sonnenschein and Richard G. Weiss 539 Depth profiles for permeation of water and oxygen in vesicles and tubule phases by fluorescence quenching studies

Santiago Nonell, Silvia E. Braslavsky and Kurt Schaffner 551 Quantum yield of production of singlet molecular oxygen ($^1\Delta_g$) in aqueous dispersions of small unilamellar lipid vesicles. A time-resolved near-IR phosphorescence study

Guangyuan Ge, Shen Zhu, Thomas D. Bradrick and S. Georghiou 557 Fluorometric analysis of the long-wavelength absorption band of N-7 methylated GMP into the constituent bands of the two electronic states

H. Grajek, G. Żurkowska, C. Bojarski and R. Drabent 565 Investigations on the fluorescence concentration quenching of flavomononucleotide in glycerine–water solutions

Atle Brun, André Western, Zvi Malik and Sverre Sandberg 573 Erythropoietic protoporphyria: photodynamic transfer of protoporphyrin from intact erythrocytes to other cells

Thormod Henriksen, Arne Dahlback, Søren H. H. Larsen and Johan Moan 579 Ultraviolet-radiation and skin cancer. Effect of an ozone layer depletion

Cheryl F. Rosen, Steven L. Jacques, Mary E. Stuart and Richard W. Gange	583	Immediate pigment darkening: visual and reflectance spectrophotometric analysis of action spectrum
A. R. Morgan, G. M. Garbo, R. W. Keck, L. D. Eriksen and S. H. Selman	589	Metallopurpurins and light: effect on transplantable rat bladder tumors and murine skin
Herbert C. Bitting, Jr., Du-Jeon Jang and M. A. El-Sayed	593	On the multiple cycles of bacteriorhodopsin at high pH
E. L. Pautler, M. Morita and D. Beezley	599	Hemoprotein(s) mediate blue light damage in the retinal pigment epithelium
Bernhard J. Fritz, Sabu Kasai and Kunio Matsui	607	Blue light photoreception in *Neurospora* circadian rhythm: evidence for involvement of the flavin triplet state
V. G. Chamupathi and G. Tollin	611	Quinones as mediators of electron transfer from membrane-bound chlorophyll to cytochrome *c* in the aqueous phase in lipid bilayer vesicles: synergistic enhancement of cytochrome *c* reduction by lipophilic/hydrophilic quinone pairs
Barbara A. Heller and Paul A. Loach	621	Isolation and characterization of a subunit form of the B875 light-harvesting complex from *Rhodobacter capsulatus*
Thomas W. Kaaret and Thomas C. Bruice	629	Electrochemical luminescence with N(5)-ethyl-4a-hydroxy-3-methyl-4a,5-dihydrolumiflavin. The mechanism of bacterial luciferase

VOLUME 51 NUMBER 6 (Published 22 May 1990) JUNE 1990

Articles

K. Heihoff, R. W. Redmond, S. E. Braslavsky, N. Rougée, C. Salet, A. Favre and R. V. Bensasson	635	Quantum yields of triplet and $O_2(^1\Delta_g)$ formation of 4-thiouridine in water and acetonitrile
Giovanni B. Strambini and Edi Gabellieri	643	Temperature dependence of tryptophan phosphorescence in proteins
Meyrick J. Peak and Jennifer G. Peak	649	Hydroxyl radical quenching agents protect against DNA breakage caused by both 365-nm UVA and by gamma radiation
David L. Mitchell, Lee A. Applegate, Rodney S. Nairn and Ronald D. Ley	653	Photoreactivation of cyclobutane dimers and (6–4) photoproducts in the epidermis of the marsupial, *Monodelphis domestica*
O. I. Kovalsky and E. I. Budowsky	659	Laser (two-quantum) photolysis of polynucleotides and nucleoproteins: quantitative processing of results
M. R. Arnfield, J. Tulip and M. S. McPhee	667	Photodynamic therapy dosimetry in postmortem and *in vivo* rat tumors and an optical phantom
Paul Galland, Petra Keiner, Dieter Dörnemann, Horst Senger, Bonita Brodhun and Donat-P. Häder	675	Pterin- and flavin-like fluorescence associated with isolated flagella of *Euglena gracilis*
Peter A. Ensminger, Xiyin Chen and Edward D. Lipson	681	Action spectra for photogravitropism of *Phycomyces* wild type and three behavioral mutants (L150, L152, and L154)
Miguel A. Quiñones and Pedro J. Aparicio	689	Flavin type action spectrum of nitrate utilization by *Monoraphidium braunii*
Paola Dainese, Gunilla Hoyer-Hansen and Roberto Bassi	693	The resolution of chlorophyll *a*/*b* binding proteins by a preparative method based on flat bed isoelectric focusing
Paul Jursinic, Nathalie Miller and Robert Carpentier	705	Ruthenium red inhibition of oxygen evolution and specific release of the extrinsic 16 kDa polypeptide in a photosystem II preparation
Jorge A. Escobar, Giuseppe Cilento and Ana L. T. O. Nascimento	713	Effects induced in neutrophils by a precursor of triplet acetone
Karin Schmitt and Giuseppe Cilento	719	The peroxidase-promoted metabolic activation of acetaminophen produces electronically excited species

Research Notes

Aydin Örstan and Ari Gafni 725 The interaction of acrylamide with glyceraldehyde-3-phosphate dehydrogenase. Structural modifications in the enzyme studied by fluorescence techniques

Lorraine H. Kligman and Micheline M. Mathews-Roth 733 Dietary β-carotene and 13-*cis*-retinoic acid are not effective in preventing some features of UVB-induced dermal damage in hairless mice

Julia Shand and John N. Lythgoe 737 The isolated iridescent cornea of the sand goby is photoresponsive

Yearly Reviews

E. W. Findsen and M. R. Ondrias 741 Transient and time-resolved optical studies of photolyzed carbonmonoxy hemoglobin and myoglobin

Lawrence Grossman and Anthony T. Yeung 749 The UvrABC endonuclease of *Escherichia coli*

John E. Frederick 757 Trends in atmospheric ozone and ultraviolet radiation: mechanisms and observations for the Northern Hemisphere

Howard K. Koh, Benjamin E. Kligler and Robert A. Lew 765 Sunlight and cutaneous malignant melanoma: evidence for and against causation

Michael Terman, Charlotte E. Remé, Brian Rafferty, Pamela F. Gallin and Jiuan Su Terman 781 Bright light therapy for winter depression: potential ocular effects and theoretical implications

Hans-Wilhelm Trissl 793 Photoelectric measurements of purple membranes